Public Concerns of MTR Mining Effects on Groundwater

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Presented to: EIS Steering Committee Workshop Participants

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Key GW Issues - Citizens are concerned that these issues are not *addressed,* or inadequately addressed, in the largest study ever undertaken to determine environmental impacts from MTR mining. Despite written and verbal requests *to* EIS overseers, citizens are unaware of meaningful studies to address these concerns.

1. Valley fills (one of the most controversial aspects of MTR mining)
   a. No wells planned or in use to *measure* GW fluctuations, flow rates, or chemistry
   b. No cluster wells to *measure* communication of VF GW with aquifers beneath the valleys
   c. Settlement issues, sorting and *eventual discrete plugging and channeling of GW*; potential for time delayed slope stability issues at discrete discharge points
   d. *Residence rime* and chemistry variations, *seasonally*
   c. Potential ''bypassing" of surface water monitoring points, by GW discharge from VFs via *subsurface pathways* (seasonal considerations and chemistry impacts *on* GW and streams)

2. Water supply wells proximal to blasting
   a. No studies using supply wells (or uniformly constructed monitoring wells) with continuous chart recorders for water level fluctuations; while simultaneously using seismographs *to correlate ground vibrations to measured GW fluctuations*; proximal to actual blasting (at various distances, and considering different stratigraphic settings)
   b. GW chemistry of wells in deeper strata possibly sourced from old deep mines, and *blasting induced subsidence effects on* turbidity, flow, GW storage, delayed responses of subsidence
   c. Domino effect of potentially less *recharge* through sealed fractures after blasting on lowermost bench (function of high volume dust, mechanical compaction); or conversely, GW quality and turbidity issues if dust is mobilized via blasting fracture planes (near term impacts)

3. Permanent GW 'storage loss in interburden/coal units (up *to* 600+ feet rcmovcd in some areas)
   a. No monitoring of multiple units throughout sequence to be mined , prior *to* MTR; *baseline on GW in various interburden units and coal seams, storage, estimated discharge* to streams on dry seasonal periods
   b. Concern over claims that no water is in storage (from dry blast hole drilling), given that blasting in higher units could have dewatered lower ones
   c. Without an estimate of this loss, the *future environmental impacts on stream flows* (derived from GW contributions in various basins) cannot be understood
   d. If diminished GW contribution to *streams* in dry seasonal periods, and thereby lower stream flow, existing waste loading rates could lead to *surface water degradation* {collateral damage to environment from decreased GW storage and discharge to *streams)*

4. GW loss or impacts below the lowermost bench
   a. Per blasting concerns abovc, *dewatering of lower strata* is a concern via induced or enhanced fractures
   b. *Blasting induced subsidence,* wen time delayed could alter GW in lower coal seams, both in terms of availability and quality
   c. *Recharge may not* be *occurring,* if fine grained particulate or dust and equipment operation arc scaling fractures

5. Guidance for determining the point of origin of intermittent streams (v. ephemeral)
   a. Given the Haden ruling on buffer zones, all parties need to dcvclop usable methods for delineating the point within a valley where a stream changes from ephemeral to intermittent; the EIS isn't likely to *identify changes in these delineations* relative in the context of recent droughts
   b. MTR and removal of GW within interburden and coal seams could result in less GW discharge and *changing of the p i n t of origin of intermittent streams* (see lack of baseline GW information above); also relative to un-mined basins in the downdip direction

6. **CW chemistry**
   a. *Application rates, and fate and transport* of chemicals and fertilizers used in reseeding areas (during contemporaneous reclamation and for post mining applications) need to be determined or estimated
   b. The potential esists for *spills or discharges* of various other chemicals of concern, iiicluding fuels, wastc oils, degreasers, ctc.; the fate of these in terms of GW is unclear

7. The basic hydrogeologic regime represents a high degree of complexity
   a. Any useful study of GW conditions should span *at least one hydrologic year*
   b. The *droughts of 1987, 1988, 1998, and 1999* have to be accounted for in some capacity
   c. The behavior of *VF material as a pseudo-aquifer* is a "wildcard" in the long term
   d. subsidence in lower stratigraphic zones may be enhanced by MTR mining; enhanced fractures could contribute to discrete zones of weakness (relative to heterogeneous materials, material strength/competency variations, fracture frequency and aperture); so that subsidence could be a *significant long term collateral impact* of MTR mining in terms of GW availability and quality.

Summary statements:

Citizens are concerned that the above items are not being *direcily* addressed in the EIS.

Citizens are questioning the lack of commitment of resources *(money for monitoring wells, etc.)* to gain direct measurement to assess these potential environmental impacts.

The impacts suggested above seem to represent *reasonable concerns.*

In instances where indirect evidence *(anecdotal data* from stream measurements) is being used to characterize hydrogeologic impacts, the potential to miss very real and very significant long-term effects of MTR on groundwater further concerns citizens.

In summary, *citizens have a very low degree of confidence in the EIS to adequately characterize groundwater impacts from* MTR *mining* – and wish as many dollars were devoted to groundwater monitoring as have been allocated to study economic impacts.